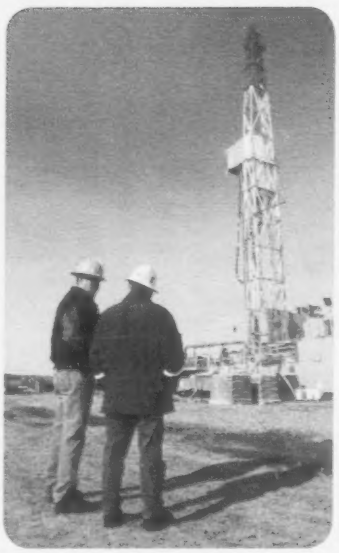
ALBERTA OIL & GAS INDUSTRY

QUARTERLY UPDATE

FALL 2012

Reporting on the period: Sep. 27, 2012, to Nov. 15, 2012



Alberta
Government

All about oil and gas*

Technology is setting the stage for another boom in Alberta's non-oil sands oil and natural gas industry. Until the last few years, the sun had slowly been setting on Alberta's conventional oil and natural gas industry. Oil production had declined from a peak of 1.43 million barrels a day in 1973 to a low of around 460,000 barrels per day in 2010.

But things are changing for the better, as increased implementation of long horizontal wells and multistage fracturing in tight oil plays across the province—not to mention new provincial royalty incentives to encourage drilling—has crude oil drilling activity and production on the upswing. Although natural gas activity has slowed due to weak prices, Alberta is poised to benefit once a price correction occurs.

In fact, the tight oil revolution that began in the United States and gradually moved north into Alberta marks the dawning of a new day for oil and natural gas exploration and production in the province.

In Alberta, the new technology is being used in an increasing number of oil plays. Among the most advanced plays are the Cardium in west-central Alberta, the Beaverhill Lake Carbonates near Swan Hills, the Viking in east-central Alberta and at Red Water north of Edmonton, in the Pemiscot at Princess in southern Alberta, and at Judy Creek in northwestern Alberta. Additionally, emerging plays include the Alberta Bakken in the southern reaches of the province, and in oil windows in the Duvernay and Montney shale.

High drilling activity in these areas will offset the steep decline in Alberta conventional production that would otherwise be expected.

In 2011, 3,170 successful oil wells were drilled, an increase of 37 per cent from 2010. The last time Alberta experienced this high level of oil drilling was in 2005. From this total, 1,818 new horizontal oil wells (including those using multistage fracturing technology) were brought on production in 2011, an increase of 78 per cent from 2010 levels of 1,023 horizontal wells. This raises the total number of horizontal wells to 6,643.

The number of new vertical oil wells placed on production is projected to be 1,440 in 2012, and is expected to decline to 1,040 wells in 2021. Although this well count is relatively low and reflects the view that many new wells will be horizontal wells using multistage fracturing technology, the 2012 forecast for the number of vertical wells has increased relative to last year, based on 2011 industry levels.

The number of new horizontal oil wells forecast to be placed on production in 2012 and beyond is projected to increase from 1,818 in 2011 to 2,160 in 2012 and 2013, and to decline gradually to 1,560 in 2021.

Although low natural gas prices have reduced drilling activity in Alberta for that commodity the past few years, when prices rebound the province will be well positioned to capitalize.

Canada is the third-largest natural gas producer in the world, with about 80 per cent of the country's gas being produced in Alberta. According to provincial figures, at the end of 2010, remaining established reserves of conventional natural gas stood at 36.4 trillion cubic feet, while remaining established coalbed methane (CBM) gas reserves stood at 2.4 trillion cubic feet. Reserve additions as a result of new drilling replaced 46 per cent of 2010 gas production. The province estimates the remaining ultimate potential of marketable conventional natural gas at 74 trillion cubic feet.

Although conventional natural gas remains a very important part of Alberta's natural gas supply, horizontal drilling and multistage fracturing now allow for development of natural gas from a new source—unconventional natural gas resources. Aside from CBM, Alberta's unconventional natural gas resources include tight gas (natural gas trapped in low-permeability sedimentary rocks, such as sandstone or limestone) and shale gas (trapped in shale rock).

For conventional natural gas, in 2011, 2,310 new conventional gas connections were placed on production in the province, a decrease of 24 per cent from 2010. This was the fifth straight year of reductions in conventional gas connections. The number of horizontal gas wells drilled and connected in the province is increasing as a percentage of the total. In 2011, about 25 per cent of new gas connections were horizontal wells compared with 14 per cent in 2010. ■

TABLE OF CONTENTS

02 **All about oil and gas**

03 **Oil plays**

04 **Natural gas plays**

05-06 **Government update**

07-08 **What's new in the oil and gas industry**

09 **Technology update**

10 **Labour update**

11-13 **Oil and gas statistics**

14-15 **Promising tight oil plays**

16 **Contacts**

All photos © 2012, JaneWarren-Nickle's Energy Group

*This publication contains information about Alberta's oil and gas industry, excluding oil sands. For information on the oil sands, please refer to the Alberta Oil Sands Industry Quarterly Update on this website.

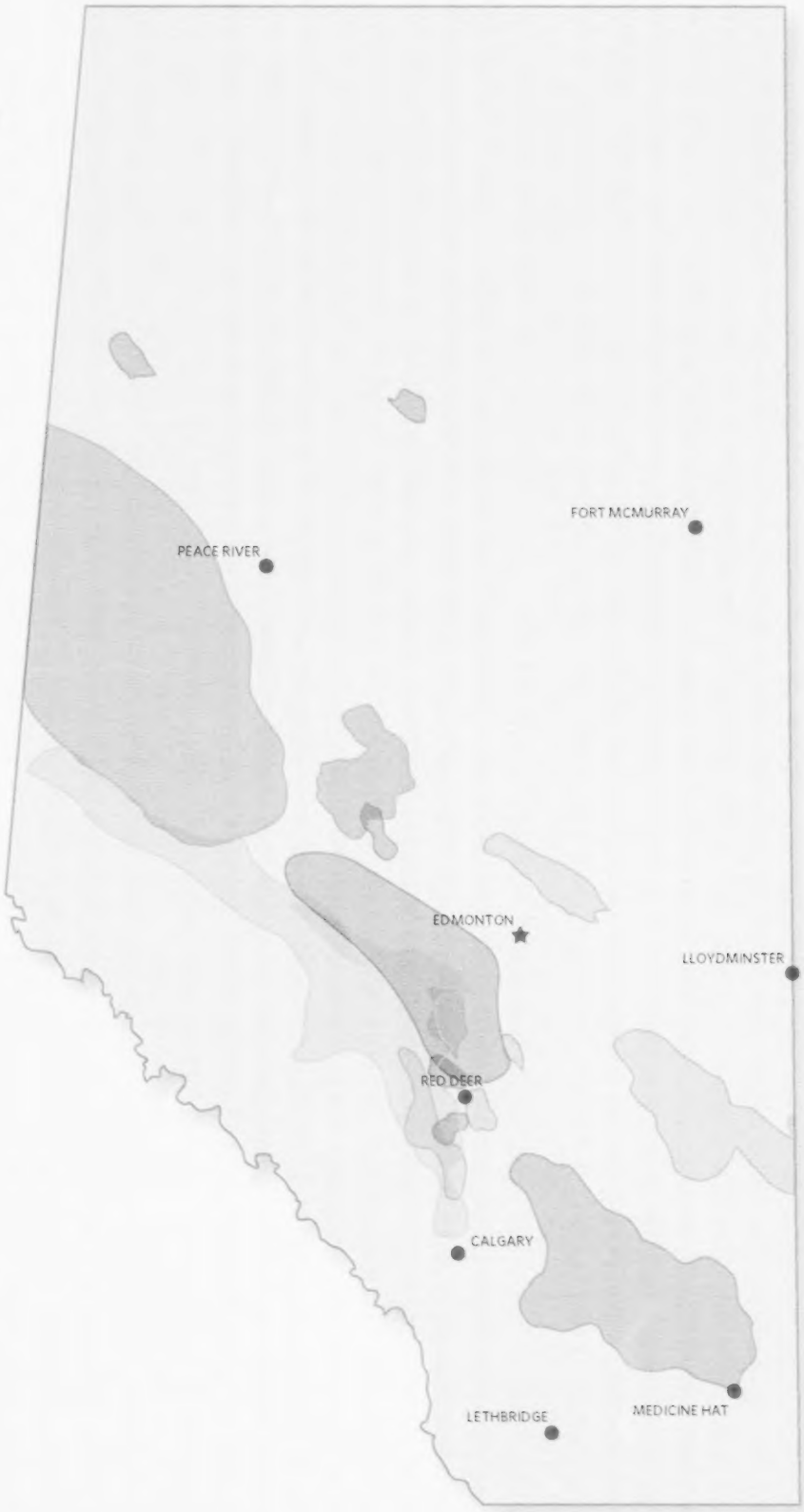
Oil plays

The Alberta Energy Resources Conservation Board (ERCB) estimates the remaining established reserves of conventional crude oil in Alberta to be 1.5 billion barrels, representing about one-third of Canada's remaining conventional reserves.

This is a year-over-year increase of 3.8 per cent, resulting from production, reserves adjustments and additions from drilling that occurred during 2011.

In 1994, based on the geological prospects at that time, the ERCB estimated the ultimate potential of conventional crude oil to be 19.7 billion barrels. Given recent reserve growth in low permeability, or tight oil plays, the ERCB believes that this estimate may be low.

Starting in 2010, total crude oil production in Alberta reversed the downward trend that was the norm since the early 1970s. In 2010 and 2011, light-medium crude oil production began to increase as a result of increased, mainly horizontal, drilling activity with the introduction of multistage hydraulic fracturing technology. The successful application of this technology and increased drilling resulted in total crude oil production increasing by seven per cent in 2011. Alberta's production of conventional crude oil totalled 179 million barrels in 2011.



Natural gas plays

Alberta's natural gas bounty is plentiful and is produced from both conventional and unconventional reserves. While the vast majority of the province's natural gas is still produced from conventional sources, growing natural gas volumes from coal, shale and tight formations will also be strong contributors going forward.

Alberta has a large natural gas resource base, with remaining established reserves of about 39 trillion cubic feet and estimated potential of up to 500 trillion cubic feet of natural gas from the coalbed methane resource. In addition, a large-scale resource assessment of shale gas potential in Alberta is underway and could significantly add to the natural gas prospects for the province.

GOVERNMENT

UPDATE

ALBERTANS TO BENEFIT FROM A MORE EFFICIENT, EFFECTIVE REGULATORY SYSTEM

Alberta is taking a bold step that will improve the energy regulation system for landowners, industry and the environment. Bill 2: The Responsible Energy Development Act, creates a single provincial regulator for upstream energy resource activities involving oil, gas, oil sands and coal.

The new regulator will be a unified one-window approach that makes it easier to navigate the system. It will also be responsible for energy resource developments from initial application to reclamation.

Under the proposed legislation, the single regulator will assume the regulatory functions of the Energy Resources Conservation Board (ERCB) and Alberta Environment and Sustainable Resource Development, with respect to oil, gas, oil sands and coal development. The arm's-length agency will be governed by a board of directors with a chief executive officer at the helm. It is expected to be operational by June 2013.

Highlights of the Responsible Energy Development Act include:

- Higher fines for individuals and companies who break the law;
- Voluntary registry for landowners to register private surface agreements, which can then be enforced; and
- Increased flexibility for the regulator to receive and process applications in a way that supports effective and fair decision making.

This single regulator is a crucial component of the province's plan to better manage its resources in an integrated manner. It builds on the Lower Athabasca Regional Land-Use Plan that came into effect September 1, and the recently announced arm's-length environmental monitoring agency.

A copy of the draft legislation can be found at www.assembly.ab.ca.

ERCB CONTRACTS THIRD PARTY TO CONDUCT ALBERTA PIPELINE REVIEW

The Energy Resources Conservation Board (ERCB) has contracted the services of an independent third party to conduct a review of certain elements of Alberta's pipeline system as announced by Ken Hughes, minister of energy, on July 20, 2012.

Group 10 Engineering Ltd., of Calgary, Alta., has been awarded the contract as a result of an open, competitive process which involved a request for proposal through the Alberta Purchasing Connection government website.

Group 10 will examine the adequacy of regulatory requirements with respect to pipelines under ERCB jurisdiction and industry best-practices in three areas: public safety and responses to pipeline incidents, pipeline integrity management, and safety of pipelines at or near water crossings. The review will be conducted in addition to the current incident-specific investigations the ERCB is conducting.

The review is expected to be completed by the end of November and the ERCB will provide Group 10's final report to the minister by the end of the year. Following this, the ERCB will review the Group 10 report and provide its own report, including resulting ERCB recommendations, if any, to the minister by March 31, 2013.

The ERCB's mission is to ensure that the discovery, development and delivery of Alberta's energy resources take place in a manner that is fair, responsible and in the public interest. In assessing the public interest, the ERCB has regard for public safety, environmental stewardship and resource conservation.

ALBERTA TO ESTABLISH ARM'S-LENGTH ENVIRONMENTAL MONITORING AGENCY

Alberta will build the most comprehensive environmental monitoring program in Canada with the establishment of a new arm's-length environmental monitoring agency.

The agency will be built on credible science, research and data collection. This is the key recommendation of the independent Environmental Monitoring Working Group report released by the Alberta government. The new science-based agency will begin work in the oil sands region and will focus on what is monitored, how it's monitored and where it's monitored. This will include integrated and coordinated monitoring of land, air, water and biodiversity.

A management board named by Environment and Sustainable Resource Development Minister Diana McQueen will immediately begin work to set up the new agency.

The work of the six-member management board will focus on how the new science-based agency will operate, long-term funding options and establishing a Science Advisory ➤

Alberta Government

Government update *continued*

Board to provide input and advice on monitoring efforts. The initial focus of the new arm's-length agency will be on the Lower Athabasca area, with the ability to expand to the rest of the province.

While the new agency is being established, environmental monitoring in the oilsands region will continue through a joint federal-provincial program announced in February. To date, that program has added new water-quality sites on the Athabasca River and Muskeg River system, increased air monitoring by adding more sampling sites and improved biodiversity monitoring to include all oil sands–producing areas.

The full report of the Environmental Monitoring Working Group is available online at http://environment.alberta.ca/03379.html.

NEB ANNOUNCES HEARING FOR TRANS MOUNTAIN PART IV APPLICATION

The National Energy Board (NEB) announced its decision to hold a public oral hearing to consider an application from Trans Mountain Pipeline ULC for approval of the toll methodology that would be implemented on the proposed Trans Mountain expanded system, if the system is eventually expanded.

Trans Mountain is not seeking board approval on its proposed facilities expansion at this time and has not filed a facilities expansion application with the board.

In assessing a toll methodology application, the board considers whether the resulting tolls would be just and reasonable, and not unjustly discriminatory to any shippers.

The process inviting public comments on the draft list of issues and the hearing process concluded on Sept. 10, 2012. After reviewing all submissions, the board decided to convene a public oral hearing, with the oral portion scheduled to begin on Feb. 13, 2013, in the NEB's Hearing Room, 2nd Floor, 444 Seventh Avenue S.W., Calgary, Alta.

The NEB has identified a number of issues for discussion during the hearing, including whether the proposed toll methodology is appropriate. The complete list of issues that the board will consider is listed in Appendix I of the hearing order [Filing A47743], available on the board's website at www.neb-one.gc.ca.

Interested parties seeking intervenor status must apply to the board, demonstrating how they may be impacted if the board were to approve the applied-for toll methodology. More information about the hearing process and applying for intervenor status is available in the hearing order or by contacting the process advisor, Reny Chakkalakal (reny.chakkalakal@neb-one.gc.ca), at 403-299-3733 or toll-free at 1-800-899-1265.

The NEB is an independent federal regulator of several parts of Canada's energy industry. Its purpose is to regulate pipelines, energy development and trade in the Canadian public interest.

RESEARCH AND INNOVATION TO BENEFIT FROM TAX CREDIT CHANGES

Changes to the Scientific Research and Experimental Development tax credit included in the new Corporate Tax Amendment Act will enhance annual benefits to Alberta research companies by $25 million per year.

This tax credit is a program that provides a refundable tax credit to corporations for research and development in Alberta.

"The Scientific Research and Experimental Development tax credit changes are good news for Alberta entrepreneurs and researchers," said Doug Horner, president of the treasury board and minister of finance. "The changes will make more funds available to support research and Alberta companies, as well as make our program more competitive with other jurisdictions."

"The Scientific Research and Experimental Development tax credit changes are good news for Alberta entrepreneurs and researchers.... The changes will make more funds available to support research and Alberta companies, as well as make our program more competitive with other jurisdictions."

—Doug Horner, minister of finance

As originally announced in Budget 2012, Bill 9 eliminates a requirement to deduct the federal investment tax credit when calculating Alberta's tax credit. The bill also extends the filing deadline for the tax credit by three months. This means that some corporations, whose claims were rejected because they were made after the original deadline, will be eligible for the credit. ■

What's new in the oil and gas industry

ALBERTA'S SHALE POTENTIAL IS VAST: REPORT

On Nov. 6, 2012, the Geological Survey of Alberta released its long-awaited report on the resource potential of shale and/or siltstone formations in Alberta.

The purpose of the report is to provide baseline data, information and understanding of the geology, distribution, reservoir characteristics and hydrocarbon resource potential of Alberta shales. The medium estimate of hydrocarbon resource endowment in place for six of the investigated units, for which available data allowed at least a preliminary determination, is 3,424 trillion cubic feet of natural gas, 423.6 billion barrels of oil and 58.6 billion barrels of natural gas liquids.

In addition to the Duvernay, Muskwa and Montney formations, estimates for the basal Banff/Exshaw (sometimes referred to as the Alberta Bakken by industry), Wilrich and north Nordegg have been included in the total resources in place, but they must be classified as preliminary. However, the initial results for these units show significant potential, says the report.

The best estimate of resource in place for the Duvernay is 443 trillion cubic feet of gas, 61.7 billion barrels of oil and 11.3 billion barrels of natural gas liquids (NGLs) and 6.8 per cent adsorbed gas content. In the high and low cases, the report estimates 353-540 trillion cubic feet of gas, 44.1-82.9 billion barrels of oil and 7.5-16.3 billion barrels of NGLs.

In its report, the Geological Survey of Alberta notes that resource evaluation methodologies and classifications are still relatively immature, due to the scarcity of data, as shales were ignored as reservoirs in the past and consequently received little attention. The fact that shale resources typically cover large regional areas rather than confined hydrocarbon reservoirs also presents difficulty for resource evaluation.

The study does not include hydrocarbons hosted in conventional reservoirs, which are still abundant. In cases for which conventional, tight and shale resources were present in a rock formation, only the shale- and siltstone-hosted hydrocarbons were evaluated.

PSAC EXPECTS 2013 WELL COUNT TO INCREASE SLIGHTLY OVER THIS YEAR

The Petroleum Services Association of Canada (PSAC) expects 11,400 wells will be rig released across Canada next year, a slight increase over the expected final tally of 11,250 wells drilled this year.

"We are cautiously optimistic about 2013's drilling activity levels," PSAC president Mark Salkeld said in releasing the association's *2013 Canadian Drilling Activity Forecast*.

"The first quarter will see a typical ramp-up of activity, and of course, slower activities in the spring with breakup," Salkeld said in a press release. "However, we expect the last two quarters of 2013 to bring increased activity as larger producers continue with their plans and mid-sized companies gain access to the capital they need."

PSAC is basing its 2013 forecast on an average natural gas price of C$3.25 per gigajoule at AECO and a West Texas Intermediate oil price of US$95 per barrel.

The association expects 7,045 wells to be drilled in Alberta—an increase of three per cent over forecast 2012 final totals.

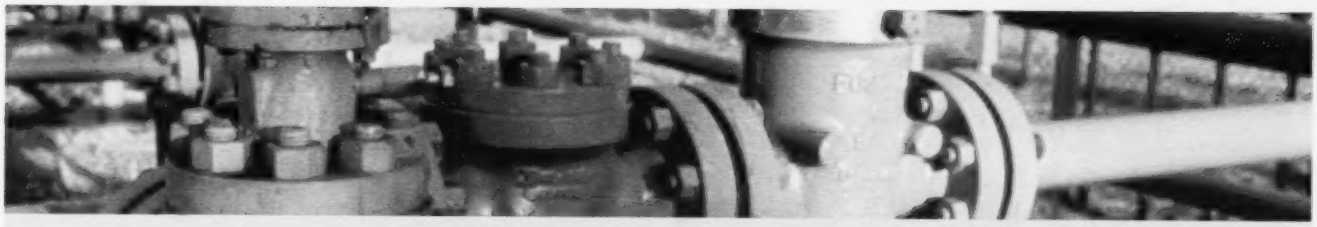
ALBERTA'S NATURAL GAS PRICE INCREASED IN OCTOBER

There was good news in October for Alberta's natural gas producers as the average spot price at AECO gained 78 cents, soaring to $3 per gigajoule from $2.22 a gigajoule in September.

The medium estimate of hydrocarbon resource endowment in place for six of the investigated units, for which available data allowed at least a preliminary determination, is 3,424 trillion cubic feet of natural gas, 423.6 billion barrels of oil and 58.6 billion barrels of natural gas liquids.

It was the first time since November of last year that that the price had been above $3, but the price was still below the October 2011 average of $3.20 a gigajoule. The higher prices may reflect tighter supplies in Canada as some producers have shut in dry gas or chosen not to bring production on stream.

Year-to-date, AECO prices have averaged $2.12 per gigajoule, the lowest in more than a decade, as the tsunami of shale gas in the United States has driven down gas prices across North America. In the first 10 months of 2011, gas fetched an average of $3.54 per gigajoule at AECO. ➤



CALGARY-BASED CELTIC SOLD FOR $3.1 BILLION

The world's biggest publicly traded oil and gas producer is doing a rare corporate acquisition in western Canada.

Calgary-based Celtic Exploration Ltd. announced announced October 17 that it's being acquired by Canadian affiliates of Exxon Mobil Corporation, including ExxonMobil Canada Ltd., for a cash price of $24.50 per share.

The deal is valued at $3.1 billion, including bank debt, working capital obligations and the amount to be paid for Celtic's outstanding convertible debentures.

In recent years, Celtic may be best known as a key pioneer in the emerging Duvernay shale play that was the subject of a massive land rush in Alberta last year.

LONGER LEAD TIMES NEEDED FOR PIPELINE PROJECTS

Alberta's oil pipeline operators stand to benefit from the growing need for new export pipelines, but the current federal regulatory environment will mean longer lead times for future pipeline projects, Standard & Poor's (S&P) Ratings Services said in a new report.

Alberta's increasing oil production, paired with regulatory delays to pipeline approvals, have squeezed export pipe capacity, making projects like TransCanada Corporation's Keystone XL critical to Canadian oil and gas producers' growth, the firm noted.

But at the same time, several new projects, including Keystone XL and others from Enbridge Inc., haven't received final approval, and S&P believes the current regulatory environment will mean longer lead times for future pipeline projects.

TIME TO GET BULLISH ON GAS

Minimal supply growth and robust demand for power generation will provide a much-needed boost to North American natural gas prices, predicts FirstEnergy Capital Corp.

"We think the fundamentals are now convincingly pointing to a major tightening of the North American [gas] market," said Martin King, FirstEnergy's vice-president of institutional research. King discussed his firm's price forecasts in a presentation titled "Crude Oil and Natural Gas Markets: Cautious Bear and Raging Bull," delivered at a JuneWarren-Nickle's Energy Group breakfast held in October.

In its latest forecast update, FirstEnergy predicts North American gas prices will finally move off their decade lows, but expects relatively flat oil prices. King's comments follow a lift in gas prices in October. King said the recent rally could be a precursor to a longer-term recovery. "And essentially what we're trying to say here is that it's time to get more bullish on natural gas trends in North America."

FirstEnergy is now forecasting an average NYMEX gas price of US$4.10 per million British thermal units for next year. (The firm's previous forecast predicted an average 2013 price of US$3.75.) Up to October 5, the 2012 NYMEX gas price averaged US$2.61 per million British thermal units, down drastically from US$4.38 during full-year 2011.

In Alberta, FirstEnergy expects AECO gas to average C$3.51 a gigajoule next year—a big jump from a 2012 average price of C$2.12 (up to October 5).

WILRICH PLAY SHOWS PROMISE

The Wilrich natural gas play would be "extremely economic" at an Alberta gas price of $3.50 per thousand cubic feet, but the shallower areas of the play are challenged at current prices, a conference heard October 11.

At the Canadian Society for Unconventional Resources' annual conference, geologist Dave Jenkinson and engineer Brian Hamm—both of McDaniel & Associates Consultants Ltd.—did a joint presentation on the findings of their recent study titled "How Rich is the Wilrich?"

The Wilrich reservoir is widely deposited in varying thicknesses and quality over an area spanning more than 200 miles in the Cretaceous-age Deep Basin fairway of northwestern Alberta.

The study—which was limited to where there has been production from horizontal wells—included areas such as Kakwa, Resthaven, Sundance, Ansell, Simonette, Pine Creek and Edson.

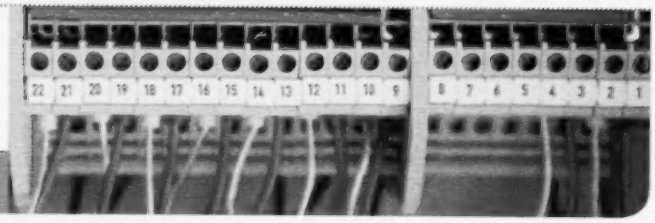
Based on more than 2,600 wells drilled to date, the McDaniel colleagues found early horizontal production results have been encouraging with the deep high-pressure areas of the reservoir significantly outperforming the shallower areas of the play.

"It appears to be at this point the most important factor in these wells," Hamm said of the correlation between reservoir depth and well performance.

He said deep-cut liquids extraction plants would definitely help the economics if producers foresee a "sustainable" gas price.

But Hamm emphasized the amount of original gas in place is enormous and "there is a lot of gas out there that is extremely economic at $3.50.... So in a $3.50-[per]-thousand-cubic-feet world, I think you drill like crazy in this play." ■

TECHNOLOGY UPDATE



ADVANCING ENHANCED OIL RECOVERY

Work towards the pipeline meant to kick-start CO_2-based enhanced oil recovery (EOR) in Alberta is continuing, while the planned upgrader/refinery that will be the pipeline's main CO_2 supplier awaits construction approval from its owners.

The 50/50 owners of the planned Redwater upgrader/refinery—North West Upgrading Inc. and Canadian Natural Resources Limited—expect to make a final investment decision by year's end, according to a spokesman for the partnership. Meanwhile, Enhance Energy Inc., which was chosen by the Alberta government to build the pipeline and related CO_2-capture facilities, is continuing preliminary work. Besides spurring EOR in central Alberta's mature oilfields, the Alberta Carbon Trunk Line will divert CO_2 from the atmosphere as part of the province's greenhouse gas-emissions reduction strategy.

Besides spurring EOR in central Alberta's mature oilfields, the Alberta Carbon Trunk Line will divert CO_2 from the atmosphere as part of the province's greenhouse gas-emissions reduction strategy.

Privately held Enhance plans to build a 240-kilometre, 16-inch-diameter pipeline capable of shipping 40,000 tonnes of CO_2 a day. The initial volume of about 5,000 tonnes of CO_2 per day will come from the proposed upgrader/refinery and an Agrium Inc. fertilizer plant, both northeast of Edmonton. The proposed pipeline will initially ship CO_2 to a mature light-oil property at Clive in central Alberta, which Enhance owns jointly with Fairborne Energy Ltd.

Enhance and the Alberta government hope more oil producers will sign up to take CO_2 once the pipeline is built, resulting in other EOR projects being announced. About 800-1,600 tonnes per day of CO_2 is to come from Agrium Inc. Enhance is depending on the planned upgrader/refinery to supply the rest of the pipeline's initial 5,000 tonnes a day.

Speaking at a Petroleum Technology Alliance Canada (PTAC) CO_2 conference held in Calgary in October, Enhance president Susan Cole said detailed engineering for the Agrium carbon capture facility has been done. All of the major mechanical equipment has been procured and the on-site tie-in to the Agrium plant completed.

The Agrium capture facility will include dehydration equipment because the CO_2 is wet. Otherwise the Agrium stream is a highly pure form of CO_2 needed for EOR. Enhance is currently doing detailed engineering for the CO_2 capture facility at the upgrader/refinery and "should be moving into procurement next year," Cole said.

UNIVERSITY PROJECT AIMS TO IMPROVE FRACTURE MONITORING

A $1.86-million joint research project at the University of Calgary and University of Alberta will help geophysicists and engineers listen to hydraulic fracture treatments.

By using geophones lowered deep into a borehole to record ground vibrations, University of Calgary and University of Alberta scientists can now pinpoint and analyze rock fracturing as it occurs. This microseismic monitoring is one of the few techniques available to track and chart the growth of fractures during hydraulic fracture treatments.

Information gathered with microseismic monitoring is used to improve the process and detect any fractures that occur outside the zone of interest. The Natural Sciences and Engineering Research Council of Canada (NSERC) is providing 50 per cent of the funding for this three-year initiative, while 10 Canadian industry partners will contribute the remainder.

"Collaborating with Alberta's oil and gas sector to investigate key industry issues, expanding international understanding of new monitoring techniques and offering students an invaluable opportunity for hands-on learning through this partnership between the University of Calgary and the University of Alberta will bring economic benefits today and tomorrow and safeguard against unexpected environmental effects," said Ed McCauley, vice-president, research, for the University of Calgary.

David Eaton, a professor of geophysics in the University of Calgary's department of geoscience, is the principal investigator for the project, while Mirko van der Baan, a physicist from the University of Alberta, will be the co-investigator. Both researchers specialize in microseismic monitoring, a rapidly developing technology that draws from several areas of research, including applied geophysics and earthquake seismology. ■

LABOUR UPDATE

PETROLEUM INDUSTRY TO BE SHORT 3,400 WORKERS BY 2015

Canada's oil and gas industry will need to fill a minimum of 9,500 jobs by 2015, according to a report released in May by the Petroleum Human Resources Council of Canada. The potential shortage of labour supply means 3,400 jobs will go unfilled in the oil and gas industry by 2015. This comes as Alberta's unemployment rate has fallen to 4.4 per cent in September 2012, down from 5.3 per cent in September last year.

Those figures also indicate that the oil and gas sector has seen employment increase by almost 30,000 since this time last year to a total of 179,200. However, labour challenges are still set to continue. According to Government of Alberta's 10-year labour force strategy, Building & Educating Tomorrow's Workforce (BETW), the energy sector faces a number of significant short- and long-term labour force challenges such as an aging workforce, increased competition for workers in Alberta and interdependency with other sectors.

BETW aims to meet Alberta's skills and labour shortages to ensure the province remains globally competitive. The strategy's goals are to:

- Inform Albertans and employers about labour market trends, training and education opportunities;
- Attract job seekers to Alberta;
- Develop the knowledge and skills of Albertans along with innovative workplaces; and
- Retain workers in Alberta's labour market

UPDATES TO THE TEMPORARY FOREIGN WORKER ANNEX

The Temporary Foreign Worker (TFW) annex is an addition to the *Agreement for Canada-Alberta Cooperation on Immigration*. The annex includes an agreement to implement a number of pilots. One of the pilots allows Citizenship and Immigration Canada to issue an occupation-specific work permit to TFWs working in Alberta in the steamfitter/pipefitter trade. Six new occupations have been added to the pilot: carpenter, estimator, heavy-duty equipment mechanic, ironworker, millwright and industrial mechanic, and welder.

More information about the TFW annex and what the updates mean for you can be found here.

HIRING FOREIGN ENGINEERS AND TRADESPERSONS

Is your organization or company interested in hiring internationally trained engineers or tradespersons? Fact sheets on hiring engineers and the best practices guide on hiring international skilled tradespersons can help Alberta employers know who to target and what to consider when hiring internationally.

THE ALBERTA IMMIGRANT NOMINEE PROGRAM (AINP)

The AINP is an immigration program operated by the Government of Alberta in conjunction with the Government of Canada. It is designed to support Alberta's economic growth by the attraction of work-ready immigrants to the province. Through this program employers are able to nominate temporary foreign workers in skilled and select semi-skilled occupations to stay permanently in Alberta.

Current processing times are now about two to four weeks. To learn more, sign up to watch a pre-recorded webinar. (http://www.snwebcastcenter.com/custom_events/govt-alberta-20120802/site/)

UPCOMING EVENTS

The Government of Alberta is planning some international recruitments events in the spring of 2013. Stay tuned to the next *Alberta Oil & Gas Industry Quarterly Update* for more information or contact us for more details. (EAE.findlabour@gov.ab.ca).

Employers interested in retaining their semi-skilled temporary foreign workers are invited to attend a 30-minute webinar to learn about one of the quickest permanent immigration options available—the Alberta Immigrant Nominee Program. There's never been a better time to apply!

Is your organization or company interested in hiring workers from the United States? The U.S. labour study can help Alberta employers with the processing of finding and recruiting workers from the United States. Stay tuned to our website for more information on the U.S. labour study webinar. ■

Oil and gas statistics

DRILLING RIG COUNT BY PROVINCE/TERRITORY

Western Canada Oct. 30, 2012

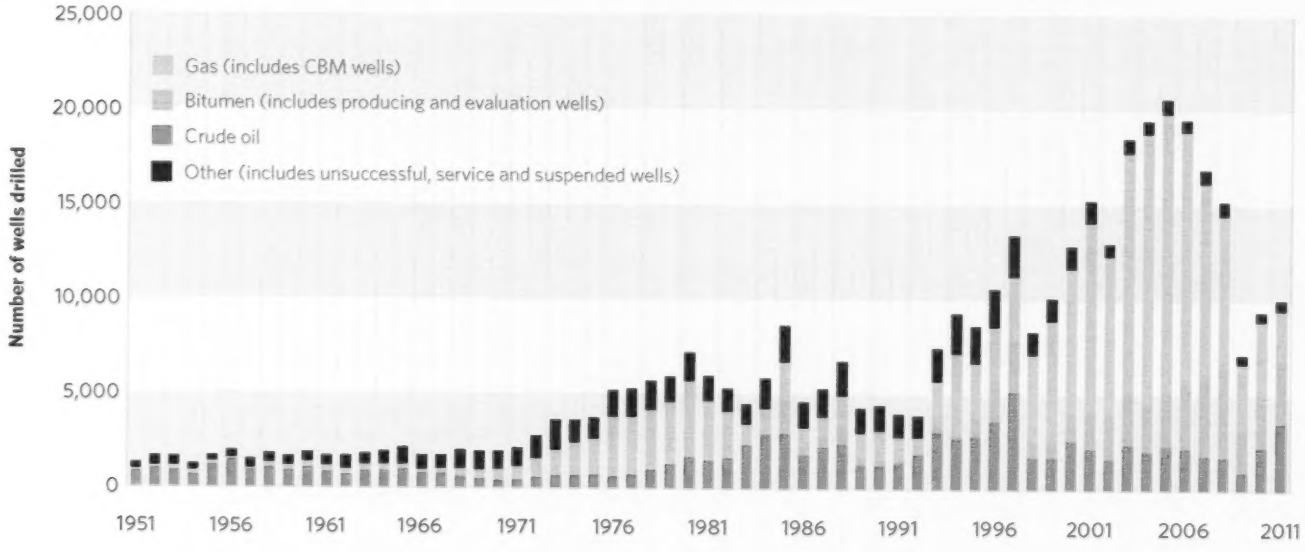
	ACTIVE	DOWN	TOTAL	ACTIVE
Western Canada				(Per cent of total)
Alberta	269	312	**581**	46%
British Columbia	35	16	**51**	69%
Manitoba	13	11	**24**	54%
Saskatchewan	86	57	**143**	60%
WC Total	**403**	**396**	**799**	**50%**
Yukon	1	0	**1**	100%

OIL & GAS WELL COMPLETIONS BY PROVINCE/TERRITORY

Western Canada Sept. 30, 2012

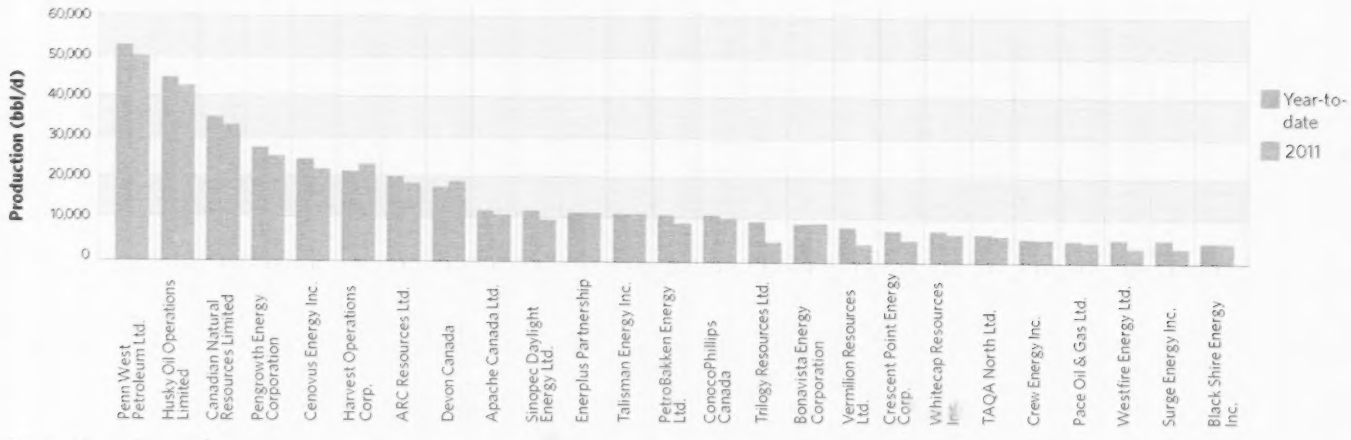
	OIL WELLS		GAS WELLS	
Western Canada	**September 2011**	**September 2012**	**September 2011**	**September 2012**
Alberta	1,015	449	347	65
British Columbia	5	1	84	9
Manitoba	63	63	0	0
Saskatchewan	350	302	1	1
Total	**1,193**	**1,163**	**332**	**1,153**

DRILLING ACTIVITY IN ALBERTA, 1951-2011



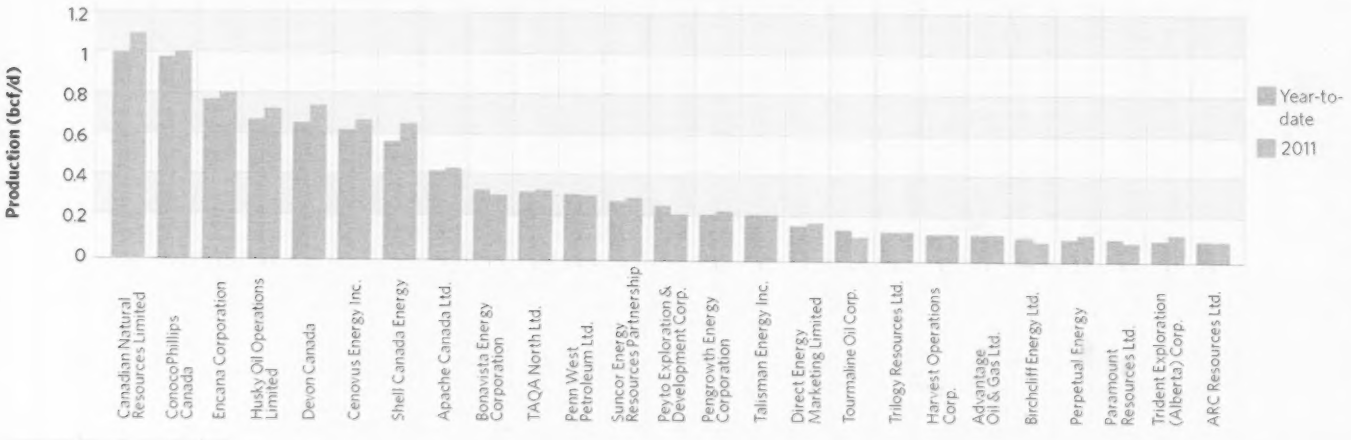
For a glossary of oil and gas terms and other industry information, go to the *Daily Oil Bulletin* toolkit:
http://www.dailyoilbulletin.com/common/toolkit.asp

TOP 25 OIL PRODUCERS IN ALBERTA (AS OF OCT. 23, 2012)

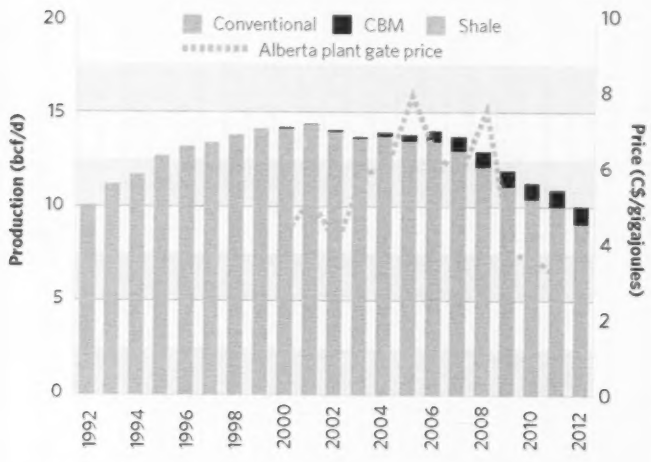


TOP 25 GAS PRODUCERS IN ALBERTA (AS OF OCT. 23, 2012)

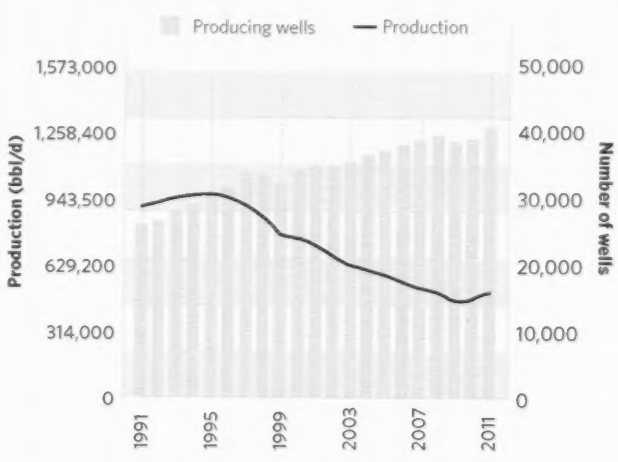
Only gas production reported from oil and gas batteries, gas gathering systems and gas plants is considered. Bitumen facilities, straddle plants and fractionation plants are excluded, as is gas from commercial gas storage schemes.



ALBERTA MARKETABLE GAS PRODUCTION

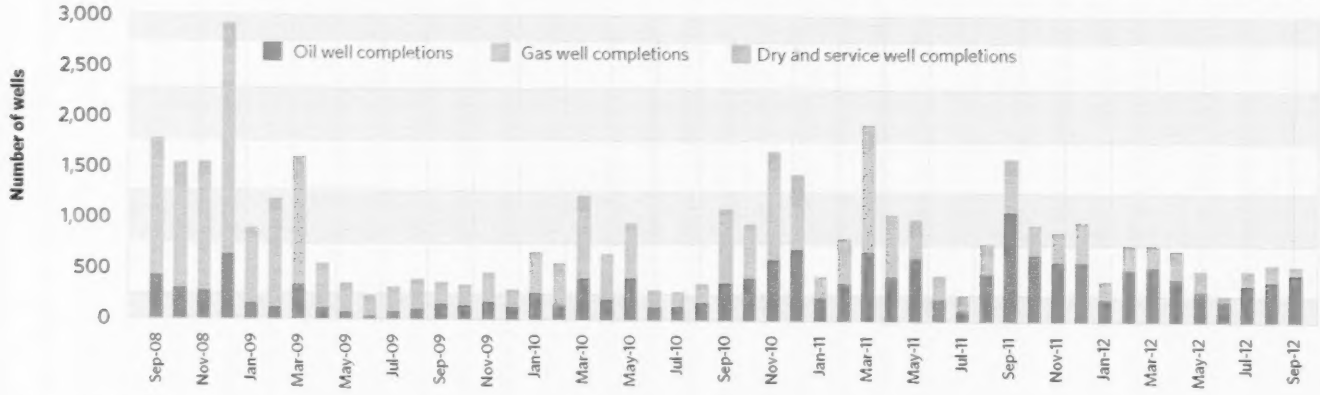


ALBERTA CRUDE OIL PRODUCTION AND PRODUCING WELLS



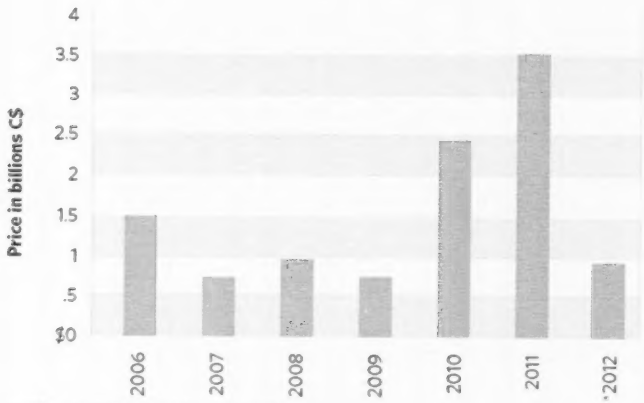
ALBERTA WELL COMPLETIONS

There were 524 well completions in September 2012, down 66 per cent from the 1,531 completions reported in September 2011. To date, there have been 3,301 oil completions, down 18 per cent from the 4,045 oil completions a year ago, and 882 gas completions, down 68 per cent from the 2,787 completions a year ago.



ALBERTA CROWN LAND SALES

P&NG rights, excluding oil sands

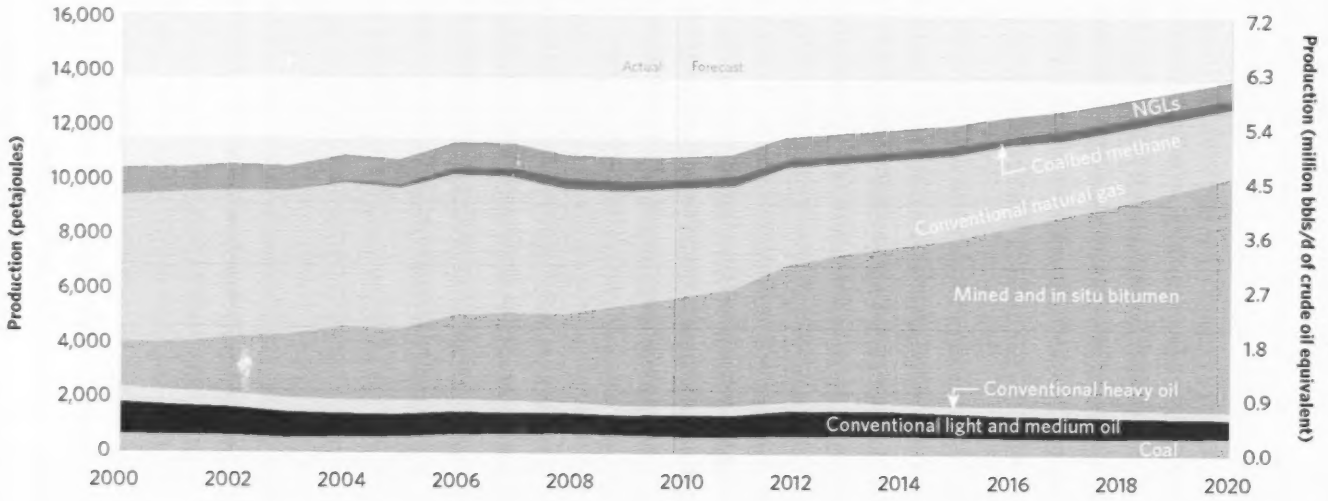


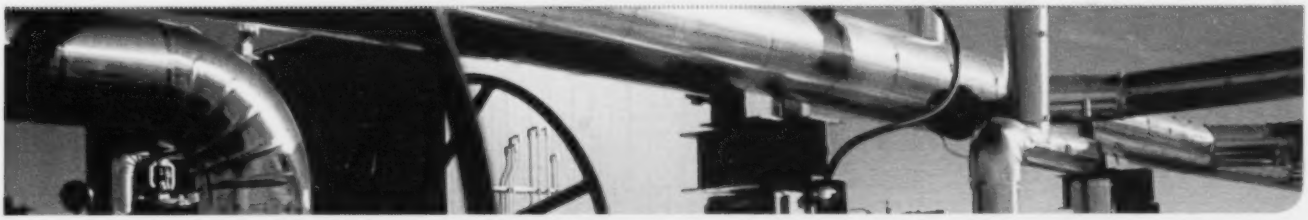
*Numbers for 2012 include sales up to October 31.

WELL DEPTHS

	GAS			OIL		
	Total metres	Wells drilled	Av. well depths (m)	Total metres	Wells drilled	Av. well depths (m)
2007	10,756,598	9,628	1,117	4,080,460	3,059	1,334
2008	9,517,507	7,886	1,207	3,931,655	2,890	1,360
2009	4,764,321	3,400	1,401	2,501,875	1,848	1,354
2010	6,037,031	3,801	1,588	5,803,292	3,681	1,577
2011	5,005,591	2,185	2,291	8,941,754	5,008	1,785

TOTAL PRIMARY ENERGY PRODUCTION IN ALBERTA





Promising tight oil plays

Alberta's crude oil potential was once thought to be declining—but not anymore. With technological advancements, both conventional fields and new oil-laden fields that were thought to be uncommercial with pre-existing vertical drilling technology are now the hot crude plays in the province. Here's a look at some of the more promising tight oil plays that have been unlocked via horizontal drilling and multistage fracturing technology.

DRAINING THE CARDIUM

Coaxing crude oil out of the ground from the Cardium formation underlying the Pembina oilfield has always been a matter of brute force.

The Pembina #1 discovery well, drilled by Socony-Mobil in the winter of 1953, required a fracture treatment consisting of diesel fuel and 3,000 pounds of sand pumped at 1,800 pounds per square inch of pressure to get oil flowing to the wellbore in commercial quantities.

Almost 60 years later, oil explorers are still at it, cracking sandstone as deep as 9,400 feet beneath the surface in the hopes of striking pay. Only now the wells drilled are horizontal and stretch as far as a mile through the reservoir. Massive fracture treatments consist of 20 tons of sand—more than 12 times as much as was pumped downhole in the Pembina #1—mixed with specialized fluids. And as many as 20 stages are fracture stimulated one after another along the horizontal leg using on average 10,000 horsepower of pumping might.

The size of the prize is huge. The Alberta Energy Resources Conservation Board says the Cardium had 10 billion barrels of original oil in place with around 1.7 billion barrels produced. However, those numbers were derived from

MOST ACTIVE COMPANIES

BEAVERHILL LAKE/ SLAVE POINT CARBONATE

1. Devon Canada Corporation
2. Nexen Inc.
3. Value Creation Inc.
4. Canadian Natural Resources Limited
5. Chevron Canada Resources Limited
6. Athabasca Oil Corporation
7. Encana Corporation
8. Sinopec Daylight Energy Ltd.
9. Celtic Exploration Ltd.
10. Husky Energy Inc.

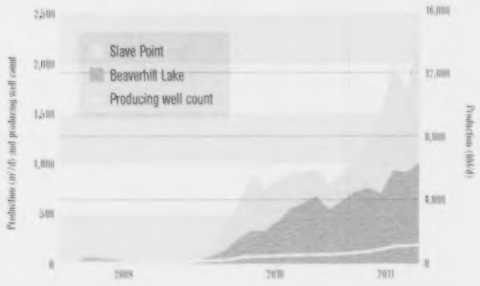
CARDIUM

1. PetroBakken Energy Ltd.
2. Sinopec Daylight Energy Ltd.
3. Whitecap Resources Inc.
4. Vermilion Energy Inc.
5. Spartan Oil Corp.
6. Penn West Petroleum Ltd.
7. ARC Resources Ltd.
8. ConocoPhillips Canada Limited
9. Angle Energy Inc.
10. Bellatrix Exploration Ltd.

BEAVERHILL LAKE/SLAVE POINT CARBONATE

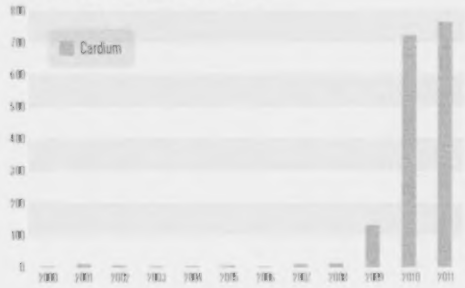
HORIZONTAL WELL LICENCES

TIGHT OIL PRODUCTION

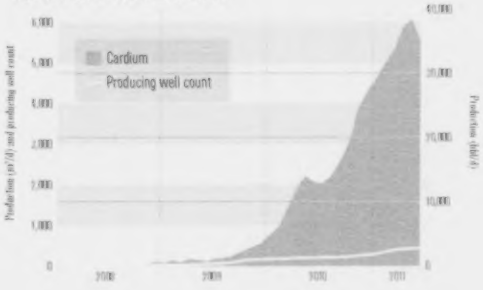


CARDIUM

HORIZONTAL WELL LICENCES



TIGHT OIL PRODUCTION



All data as of November 2011.

historical records from vertical drilling in the play. Estimates now suggest the Cardium could contain as much as 15 billion barrels of oil, and expect 20-30 per cent of that oil could ultimately be recovered.

RETURN TO SWAN HILLS

The Beaverhill Lake carbonate play in the Swan Hills north of Edmonton is another hot tight oil play in central Alberta. Home Oil Company originally discovered the North Swan Hills field in 1956. Amoco Corporation and Gulf Oil Corporation discovered the South Swan Hills unit in 1959. Combined, the two fields had around four billion barrels of oil in place.

Producers are using a 14-stage fracture stimulation program with a retrievable multi-fracturing tool that allows full wellbore access later if needed. More and more acid is being pumped in each fracture stage to open up more reservoir. Operators are now injecting as much as 1,200 cubic metres of acid per stage. The acid treatment is custom designed for the formation rock. Jet pumps are being used to enhance cleanup after the fracture stimulation to mitigate any formation damage, and multi-well pads are being used to cut costs and environmental footprints.

PIERCING THE VIKING

Another major play taking shape in central Alberta is in the Colorado Group, in the eastern reaches of the province. The Viking oil play at Halkirk and Redwater has mainly entered development mode while in other areas it remains in exploration mode. Given the strength of oil prices in this market, the Viking will be targeted by more and more operators providing new well data and evolving the play in the province.

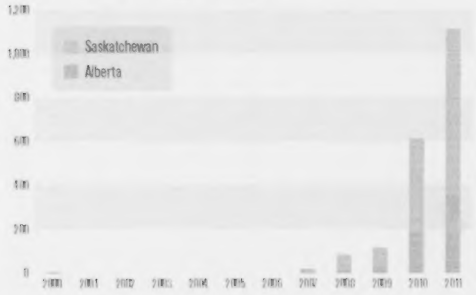
In 2012, WestFire Energy Ltd., which in October 2012 amalgamated with Guide Exploration Ltd. to become Long Run Exploration Ltd., has been the premier Viking player in Alberta. At Redwater, WestFire holds 62 net sections of land. In the first quarter of 2012, the company drilled 32 Viking wells achieving a marked improvement in initial production rates, thanks to its modified completion methods.

Penn West Petroleum also has a significant position in the Viking oil play. On the Alberta side, production results from the gassy-oil wells drilled in 2012 continue to be encouraging, reports the company. Plans for the third quarter included eight additional wells and the expansion of the company's gas-handling infrastructure to support its 2013 drilling programs.

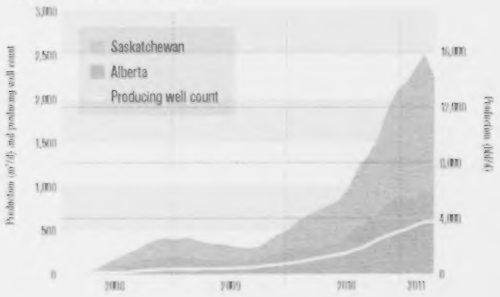
Novus Energy Inc. recognizes the vast potential of the Viking, and the company recently amassed 46 net sections of Crown lands prospective for Viking oil in the Provost area of Alberta. Novus believes the assembled acreage meaningfully increases the company's future drilling and development inventory. Drilling on these lands is planned for early 2013. ■

VIKING

HORIZONTAL WELL LICENCES

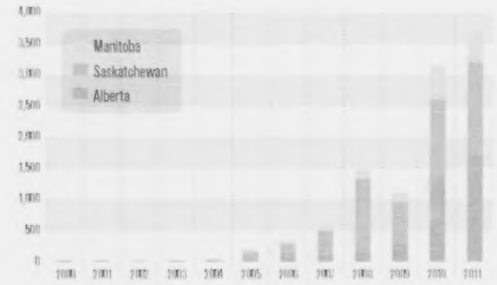


TIGHT OIL PRODUCTION

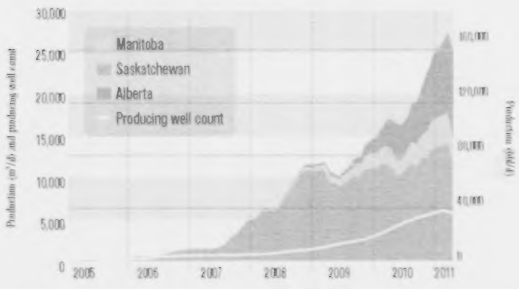


WCSB OVERVIEW

HORIZONTAL WELL LICENCES



TIGHT OIL PRODUCTION



MOST ACTIVE COMPANIES

VIKING

1 WestFire Energy Ltd.
2 Apache Canada Ltd.
3 Penn West Petroleum Ltd.
4 Cutpick Energy Inc.
5 Crescent Point Energy Corp.
6 Mancal Energy Inc.
7 Charger Energy Corp.
8 Husky Energy Inc.
9 Bonavista Energy Corporation
10 Copper Island Resources Ltd.

CONTACTS

Industry Associations

• Alberta Land Surveyor's Association	www.alsa.ab.ca
• Canadian Association of Geophysical Contractors	www.cagc.ca
• Canadian Association of Oilwell Drilling Contractors	www.caodc.ca
• Canadian Association of Petroleum Producers	www.capp.ca
• Canadian Energy Pipeline Association	www.cepa.com
• Canadian Gas Association	www.cga.ca
• Canadian Natural Gas	www.canadiannaturalgas.ca
• Canadian Natural Gas Vehicle Alliance	www.cngva.org
• Canadian Society of Exploration Geophysicists	www.cseg.ca
• Canadian Society of Petroleum Engineers	www.speca.ca
• Canadian Society for Unconventional Resources	www.csur.ca
• Gas Processing Association Canada	www.gpacanada.com
• Petroleum Services Association of Canada	www.psac.ca
• Petroleum Technology Alliance Canada	www.ptac.org
• Small Explorers and Producers Association of Canada	www.sepac.ca

Alberta Government

• Alberta Energy	www.energy.gov.ab.ca
• Alberta Environment and Sustainable Resource Development	www.srd.alberta.ca
• Alberta Enterprise & Advanced Education	www.eae.alberta.ca
• Energy Resources Conservation Board	www.ercb.ca
• Alberta Innovates	www.albertainnovates.ca
• Alberta Geological Survey	www.ags.gov.ab.ca
• Alberta Surface Rights Board	www.surfacerights.gov.ab.ca

For more information, visit us at:

www.albertacanada.com